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Mailing Certification

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Anne Marie Pickel
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Patent #1734

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of HERR et al.

Serial No. 09/336,245

Group Art Unit: 1734

Filing date: June 18, 1999

Examiner: T. Zalukaeva

Title: Die Attach Adhesives for Use in
Microelectronic Devices

Date of this response:
13 November 2000

AMENDMENT pursuant to 37 CFR 115

Assistant Commissioner for Patents
Washington, D.C. 20231

Sir:

This is in response to paper number 4 mailed 07 August 2000, and includes a Petition for an Extension of Time.

Claims 1 to 37 are pending in the application.

Claims 8 to 36 are withdrawn from consideration.

Claims remaining for consideration are claims 1 to 7 and 37.

Applicants affirm election of claims 1 to 7 and 37 (Group I) for prosecution without traverse.

Claims 1, 4, 5, 6, and 7 are amended. Claims 2 and 3 are canceled.

Applicants request reconsideration of this application in view of the following amendments and remarks.

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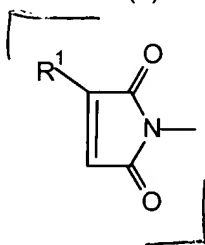
AMENDMENT

Kindly cancel claims 2 and 3 and amend claims 1, 4, 5, 6, and 7 as follows:

B

1. (amended) A curable adhesive composition for use in bonding an electronic component to a substrate comprising a maleimide compound and a curing initiator selected from the group consisting of a free-radical initiator, a photoinitiator, and a combination of those, the maleimide compound having the formula $[M-X_m]_n-Q$ in which m is 0 or 1 and n is 1 to 6, and

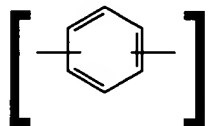
(a) M is a maleimide moiety having the structure:



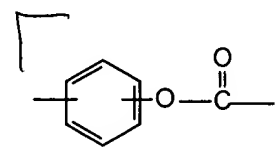
in which R¹ is H or an alkyl group having 1 to 5 carbon atoms;

(b) X is an aromatic group selected from the group of aromatic groups having the structures:

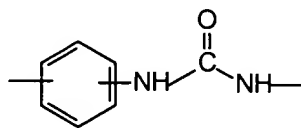
[(I)]



[(II)]

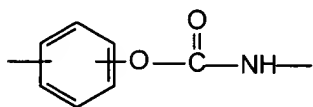


[(III)]



and

[(IV)]

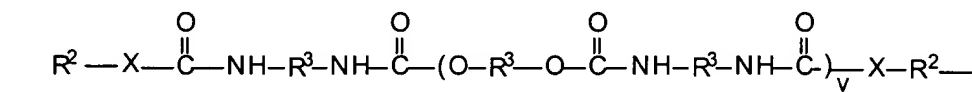
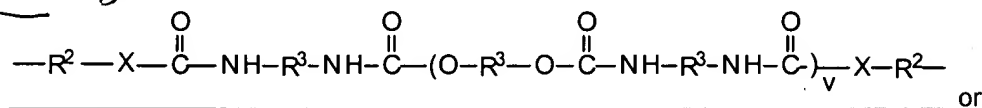


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and

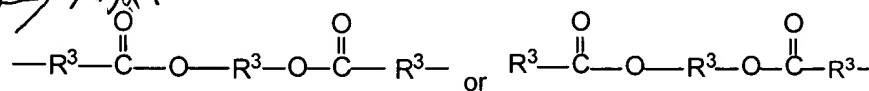
[(c) Q is a linear or branched chain alkyl, alkyloxy, alkyl amine, alkyl sulfide, alkylene, alkyleneoxy, alkylene amine, alkylene sulfide, aryl, aryloxy, or aryl sulfide species, which may contain saturated or unsaturated cyclic or heterocyclic substituents pendant from the chain or as part of the chain, and in which any heteratom present may or may not be directly attached to X;]

Ans B1 ~~(c) Q is a urethane having the structure:~~



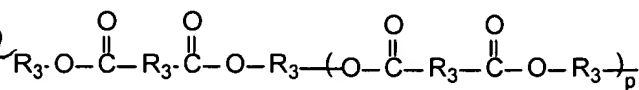
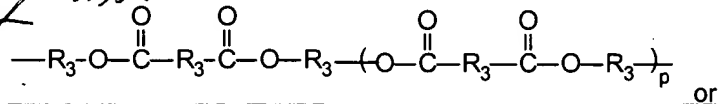
in which each R² independently is an alkyl, aryl, or arylalkyl group having 1 to 18 carbon atoms; R³ is an alkyl or alkyloxy chain having up to 100 atoms in the chain, which chain may contain aryl substituents; X is O, S, N, or P; and v is 0 to 50.

Ans B2 ~~(d) Q is an ester having the structure:~~



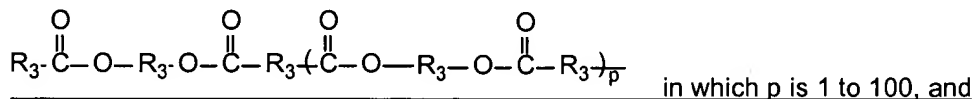
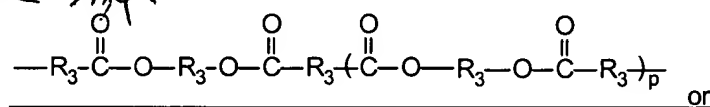
in which R³ is an alkyl or alkyloxy chain having up to 100 atoms in the chain, which chain may contain aryl substituents; or

Ans B3 ~~(e) Q is an ester having the structure:~~



in which p is 1 to 100, and each R³ can independently be an alkyl or alkyloxy chain having up to 100 atoms in the chain, which chain may contain aryl substituents; or each R³ can independently be a siloxane having the structure $-(CR^1_2)_e-[SiR^4_2-O]_f-SiR^4_2-(CR^1_2)_g-$ in which the R¹ substituent independently for each position is H or an alkyl group having 1 to 5 carbon atoms, the R⁴ substituent independently for each position is an alkyl group having 1 to 5 carbon atoms or an aryl group, e and g are independently 1 to 10, and f is 1 to 50; or

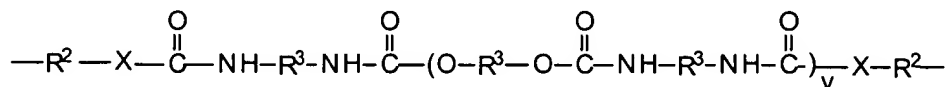
~~(f) Q is an ester having the structure:~~

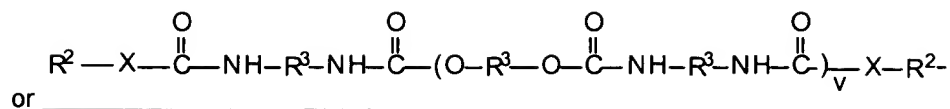


in which p is 1 to 100, and

each R³ can independently be an alkyl or alkyloxy chain having up to 100 atoms in the chain, which chain may contain aryl substituents; or each R³ can independently be a siloxane having the structure $-(CR^1_2)_e-[SiR^4_2-O]_f-SiR^4_2-(CR^1_2)_g-$ in which the R¹ substituent independently for each position is H or an alkyl group having 1 to 5 carbon atoms, the R⁴ substituent independently for each position is an alkyl group having 1 to 5 carbon atoms or an aryl group, e and g are independently 1 to 10, and f is 1 to 50.

(amended) The curable adhesive composition according to claim 1 in which Q is a urethane having the structure:



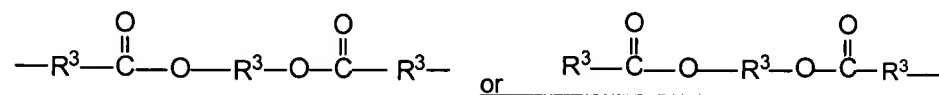


in which each R^2 independently is an alkyl, aryl, or arylalkyl group having 1 to 18 carbon atoms; R^3 is an alkyl or alkyloxy chain having up to 100 atoms in the chain, which chain may contain aryl substituents; X is O, S, N, or P; and v is 0 to 50.

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(amended) The curable adhesive composition according to claim

1 in which Q is an ester having the structure:

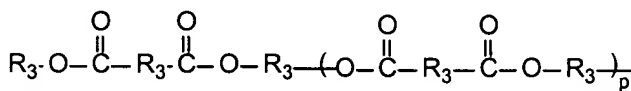
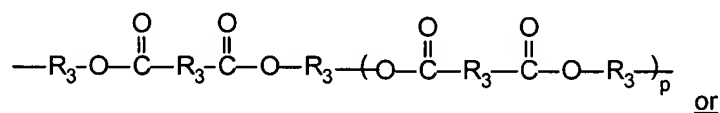


in which R^3 is an alkyl or alkyloxy chain having up to 100 atoms in the chain, which chain may contain aryl substituents.

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(amended) The curable adhesive composition according to claim

1 in which Q is an ester having the structure:



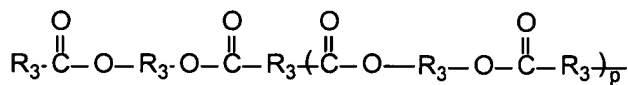
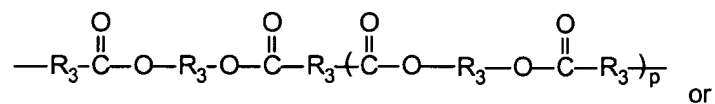
in which p is 1 to 100, and each R^3 can independently be an alkyl or alkyloxy chain having up to 100 atoms in the chain, which chain may contain aryl substituents; or each R^3 can independently be a siloxane having the structure $-(\text{CR}^1_2)_e - (\text{SiR}^4_2 - \text{O})_f - \text{SiR}^4_2 - (\text{CR}^1_2)_g -$ in which the R^1 substituent independently for each position is H or an alkyl group having 1 to 5 carbon atoms, the R^4 substituent independently for

each position is an alkyl group having 1 to 5 carbon atoms or an aryl group, e and g are independently 1 to 10, and f is 1 to 50.

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(amended) The curable adhesive composition according to claim

1 in which Q is an ester having the structure:



in which p is 1 to 100, and each R^3 can independently be an alkyl or alkyloxy chain having up to 100 atoms in the chain, which chain may contain aryl substituents; or each R^3 can independently be a siloxane having the structure $-(CR^1_2)_e-(SiR^4_2-O)_f-SiR^4_2-(CR^1_2)_g-$ in which the R^1 substituent independently for each position is H or an alkyl group having 1 to 5 carbon atoms, the R^4 substituent independently for each position is an alkyl group having 1 to 5 carbon atoms or an aryl group, e and g are independently 1 to 10, and f is 1 to 50.